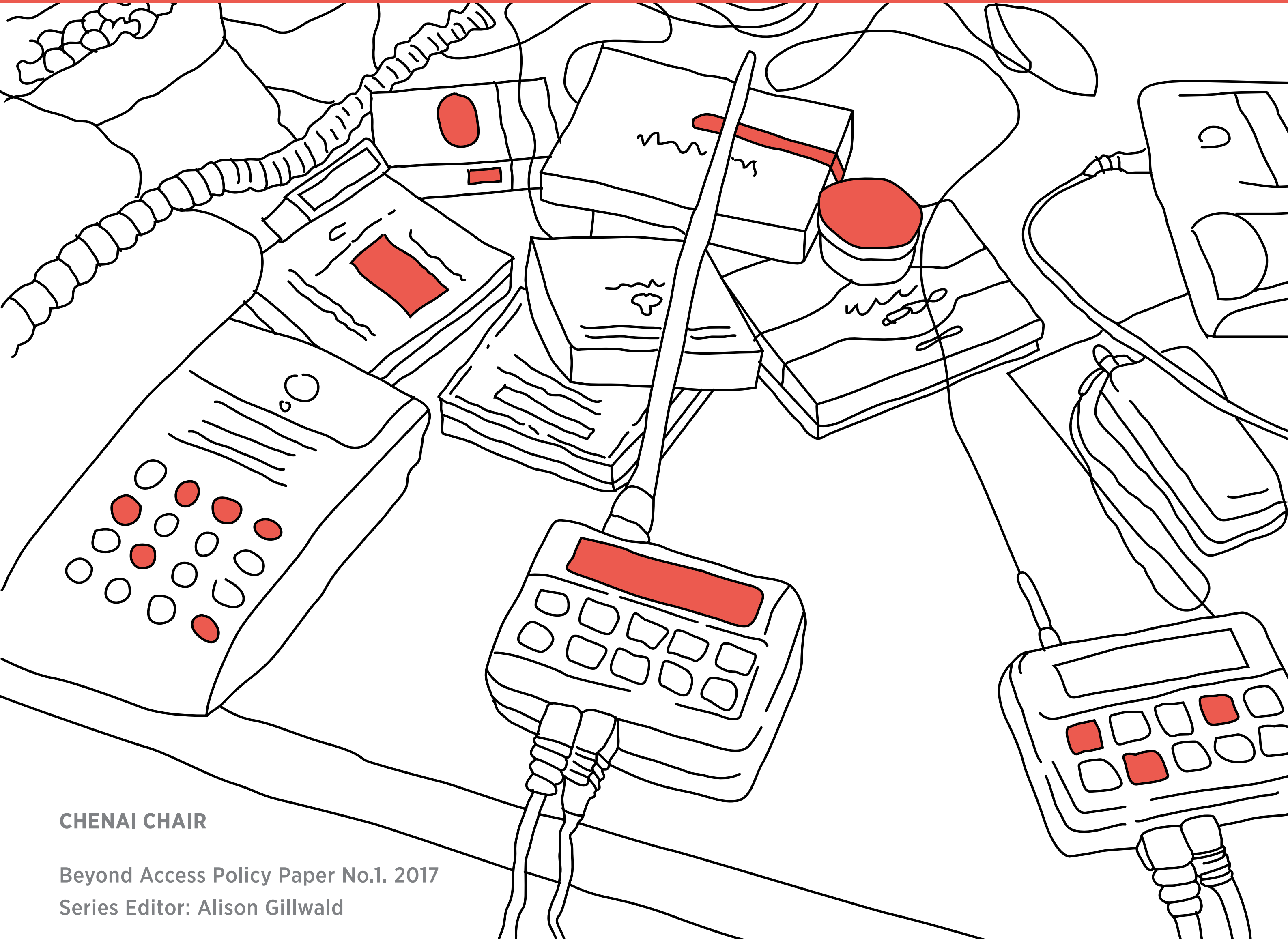
INTERNET USE BARRIERS AND USER STRATEGIES:

PERSPECTIVES FROM KENYA, NIGERIA, SOUTH AFRICA AND RWANDA



CHENAI CHAIR

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This study was commissioned by the Mozilla Foundation as part of a wider study examining the 'Beyond Access' challenges that underlie digital inequality being undertaken across the Global South with the support of International Development Research Centre (IDRC). Focus groups were also carried out in India in Asia and Peru and Columbia in Latin America.

The focus groups were designed drawing on the results of the ICT access and use surveys conducted by Research ICT Africa in 2012. These studies provide a qualitative examination of Internet use and the barriers and user-strategies adopted to overcome limitation. It also examined some of the supply side issues such as the role of subsidised OTT services in enabling or limiting access to and use of the Internet. The findings will be used to inform and refine the in-depth questionnaire that covers a myriad of issues from expenditure and capabilities of users to social networking and cybersecurity awareness.

"We don't believe possession of a smartphone is enough to unlock the possibility of the Web for a significant set of people. We believe the open Internet is a social, educational, and economic tool that can build communities and businesses, and empower individuals. We support field research and analysis to dig into deep questions about user behavior and real-world effects of access models."

- Mitchell Baker, Mozilla

"As more and more governments, donors, and non-governmental organisations (NGOs) invest in technology to help improve conditions in areas such as agriculture, health, education, and gender empowerment, they need to understand how the communities they are trying to help access and use the technology. Without that understanding, their programs are vulnerable to failure."

- Elder et al. 2013

Analysis based on country cases by:
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EXECUTIVE SUMMARY

Affordability is cited as one of the biggest challenges to Internet uptake and use. Some service providers and users of over-the-top (OTT) platforms and applications have devised strategies that allow the OTT services to be used as communication substitutes for traditional voice and SMS services over mobile devices. The OTT services have become the main entry point to the Internet for most users in the prepaid mobile environment that characterises most African markets. To entice price-sensitive users and to encourage new Internet users, the availability of subsidised data - whether discounted or free - prompts questions of how Internet access and use are affected. Does it enable access to the Internet for first-time users? Does it improve the intensity of use, allowing people to explore the Internet without concerns of cost? Does it lock people into pared-down versions of social networking platforms? This comparative country study, based on focus groups conducted in November 2016 in Kenya, Nigeria, Rwanda and South Africa, sought to develop evidence of why people, use the Internet the way they do, specifically when their data is subsidised.

To answer these questions Research ICT Africa (RIA) conducted focus groups in Kenya, Nigeria, Rwanda and South Africa in November 2017. The groups were stratified based on urban and rural location and on gender. The finding highlighted the relationship that Internet access and use have with the social and economic context of both users and non-users. By reviewing the findings based on geographical location, gender and the extent of Internet use, similarities as well as differences in the comparative countries can be identified. The Internet is an important means of communicating and finding information on various platforms whether social media, email or search engines. In an environment where voice and SMS tariffs are more expensive in comparison with similar data offerings across all regions and regardless of location, the Internet is perceived as an easier and cheaper alternative.

Motivations for people to go online are widespread. Students go online for research purposes, professionals to communicate with colleagues and unemployed people go online to look for work opportunities. People use the Internet for business, work and for financial transactions. Staying in touch with friends and family, making new friends and possibly finding relationships online motivate people most to access and use the Internet, though this is seldom the sole reason.

With regards to content, people are unable to list their top sites but the search engine, Google, was identified as the main entry point to other sites that people accessed. Assessing whether there is

a difference between men and women in content access, men seem to favour sports and betting content while women tend to search more for fashion, online-shopping and health content.

The lack of, or limited availability of, local content is a barrier to Internet uptake. In Rwanda and Nigeria local content is immensely popular. Informational government and local news sites are popular in the former, whereas Nigerian respondents preferred entertainment sites with movies, downloadable content and celebrity updates.

Surprising perhaps, considering the controversy around zero-rated services such as Freebasics, people are not highly dependent on subsidised data to access the Internet, but they are a tactic of broader price-control strategies. Mobile phones remain the most popular means of Internet access the for most respondents. Using personal laptops, however, or accessing computers elsewhere such as the work place, Internet café or public library, are another means of access for urban and peri-urban users. In all countries, fully-subsidised data is offered by one or two mobile operators. This does not tie down users to limited content available, nor does it result in new users going online because of it. What is clear across all countries is that subsidised data forms part of multiple user strategies for data-cost management, which is stongly dependent on the availability of 'free' data as well as the culture of OTT substitution.

None of the new Internet users that formed part of the focus groups reported that they went online because of the availability of Freebasics. There was little awareness of the service in addition to scepticism regarding free data more general. There was a common perception that nothing is ever truly free. These strategies included a preference for buying mobile monthly, weekly or daily data bundles, or using specific products such as Facebook or WhatsApp-only bundles. To capitalise on data offers and promotions (and as an indication of poor network quality) people also used multiple SIM cards. Poor network quality and coverage limits the consumption of subsidised data since some respondents reported not having service coverage. This lack of market choice is more prevalent in the rural areas of Kenya, Rwanda and South Africa.

Subsidised data does not lock users into specific content avenues since other means of accessing the Internet were reported during the focus groups. Most respondents in urban and peri-urban areas used private individual connections, sought out free Wi-Fi provided by commercial entities, and sought the free public Wi-Fi provided in a public location or on transport services by government-led initiatives in Rwanda and South Africa. This service is mainly available in urban areas, as noted from the peri-urban and rural respondents who still had to travel to access public Wi-Fi points. Interestingly, some respondents in Rwanda and South Africa rely exclusively on

Internet cafés as they do not have mobile devices. Wi-Fi and Internet cafés are used for data-intensive activities such as downloading movies or time consuming projects such as resumé writing.

Supply-side barriers to Internet use for both users and non-users alike are cited as limited coverage, poor quality of service and electricity shortages. In deep rural South Africa, the extent of Internet use is constrained by the limited sources of power to charge mobile phone batteries. The devices need to be taken to a different charging point, often overnight. The low affordability of data and devices is cited as another barrier to use by both Internet users and non-users. For non-users of the Internet, the choice of spending the income you have on data may have the opportunity cost of basic commodities such as food.

Moreover, skewed perceptions of Internet content from the respondents limits Internet use. Women are wary of the content they would be exposed to online and how it can affect their intimate relationships. There is concern about privacy and security as people fear financial fraud or misrepresentation online. Gendered issues of patriarchy and power relations between men and women impair Internet use and are perceived, in some cases, as interfering with their relationships. Time spent online is perceived by some men and women to take women away from looking after their partners and fulfilling family responsibilities.

Digital skills and illiteracy are demand-side issues that greatly affect non-users as well – even those who have smart devices, limiting their Internet use.

The evidence gathered here is based on focus groups with individuals selected on the grounds of locality (urban or rural) and gender to explore social, cultural and softer economic issues with the depth that cannot be quantified in surveys. Gathering evidence in this way enables the identification and inference of emerging trends, usage patterns, price-quality optimisation and the way social relations influence these. It also raises issues that require quantification in the forthcoming “Beyond Access” survey being undertaken in 2017 across 20 countries in the Global South.

This study serves to nuance the quantitative evidence used for policymaking. To this end, the report indicates that subsidised data does not limit the extent of Internet use, but rather that the extent of Internet use needs to be understood in relation to several contextual factors. Internet users make use of subsidised data to manage their data costs together with other tactics. Reducing the cost of data and providing affordable services should remain a policy solution to low Internet use. However, this should be done to improve infrastructural policy solutions, such as the release of spectrum and the promotion of community-based initiatives addressing rural connectivity where users often have little choice among services providers.

'Beyond access' challenges require a rights-based approach to deal with barriers such as privacy and security online by ensuring and raising awareness thereof, for example. The possibilities of achieving this in a digital context where offline rights do not exist is one of the biggest challenge for many countries. Other factors limiting the participation of the poor and un-skilled, particularly women and rural populations, will require much more extensive multi-generational policy intervention to address broader inequalities in the economy and society, particularly in relation to unequal education, that play out on digital platforms. Without such interventions of redress, the expansion of the Internet will perpetuate and even amplify digital inequality in society.

"I think those free things to be honest do not motivate us to use the Internet to buy data. Personally speaking those things do not motivate me. Those free data and what you call it, the Internet shark swallows it very quickly."

- Urban male respondent, South Africa

BACKGROUND

While mobile phone uptake has been growing exponentially, Internet uptake on the continent has been relatively slow (Research ICT Africa database, 2008, 2012). In some of the countries with the lowest penetration (Ethiopia, Uganda, Rwanda, Tanzania) the first point of entry into the Internet is through the mobile phone (Stork, Calandro and Gillwald, 2013). Studies have shown that more individuals in sub-Saharan Africa are accessing the Internet through their mobile phones with social networking contributing to the accelerated use of the Internet (Stork, Esselaar, Chair and Khan, 2016).The nationally representative 2011/12 RIA Household and Individual ICT Access and Use Survey showed that in South Africa, Kenya and Nigeria, users are not only most likely to access the Web for the first time on a mobile phone, but also that they are most likely to do so in order to use a social media platform, such as Facebook (RIA, 2012). A 2014 baseline study on digital readiness in the Western Cape Province in South Africa found that 48% of Internet users said their main reason for going online was to access social media, confirming this trend (Calandro Chair and Deen-Swarray, 2015).

While mobile broadband has driven Internet take up across the continent, 75% of Africa remains unconnected (Broadband Commission, 2017). The barriers that Africans face have been linked to traditional supply side infrastructural issues but, as more people become connected, demand side issues become apparent (affordability of data services, relevance of content, capabilities, deficits, illiteracy, digital skills) as well as a gender and rural urban divide(Broadband Commission, 2017).

Affordability of has been a longstanding challenge to Internet access and use for both users and non-users as determined by the RIA 2011/12 survey findings (Stork *et al.*, 2016). In South Africa for example, a social media campaign, #datamustfall, was launched to lobby government to intervene to reduce prices (Mamabolo, 2016). Illiteracy and a lack of digital skills are seen to impact even those who have grown up in the era of Internet access. A study on African youth and ICTs, based on RIA's 2008 and 2011/12 survey data, found that digital illiteracy impedes Internet use as some do not know what the Internet is or how to use it (Deen-Swarray and Chair, 2016). Quality of service in relation to network speeds and privacy concerns are also emerging barriers for Internet use (Calandro *et al.*, 2015).

Income and education inequalities are the major factors for the uneven use of the Internet between men and women and this is compounded by the urban-rural divide (Deen-Swarray, Gillwald, Morrell and Khan, 2013). Women in rural areas and those in lower income groups (e.g. urban poor) are more

likely to have unequal access to ICTs on the basis of income, education and social position (Deen-Swarray *et al.*, 2013). Women are likely to spend more of their limited income on mobile phones (Gillwald, Milek and Stork, 2010). There is also more likely to be a gap between women in urban and rural areas (Khan, Chair and Deen-Swarray, 2016).

Affordability is one of the main reasons people do not access the Internet and for the low levels of use by those with access in Africa (Stork *et al.*, 2016). In South Africa, for example, a social media campaign, #datamustfall, was launched to lobby government to intervene to reduce prices resulting in parliamentary hearings on the cost to communicate and indicating to operators that it will monitor prices and expects them to be substantially reduced within the next year.

Solutions that are proposed to close the connectivity gap are plausible only when different players are aware of the ways in which people use the Internet. Increasingly, demand side challenges to Internet use that move beyond infrastructural challenges are coming to the fore in the data environment. In recent years, demand side solutions, such as the introduction of subsidised zero-rated services and the roll out of public Wi-Fi in South Africa and Rwanda, for example, have been pioneered as a way to connect the unconnected. These have sought to tackle the issue of affordability that would attract new users and provide popular content and free data for regular Internet users (Gillwald, Chair, Futter, Koranteng, Odufuwa and Walubengo, 2016; Geerdts, Gillwald, Calandro, Chair, Moyo and Rademan, 2016).

RESEARCH QUESTION

To understand Beyond Access issues with relation to the way people use the Internet, focus groups were conducted in Kenya, Nigeria, Rwanda and South Africa. Knowing that affordability is one of the primary barriers to Internet access and particular optimal use, the main objective of the focus groups was to obtain qualitative information that reflects the perceptions of female and male Internet users, new users, and non-Internet users from urban and rural locations about how people use the Internet when their data is subsidised, and when it is not subsidised. The focus group location categorised as 'urban areas' focused on metropolitan areas, 'peri-urban' focused on areas on the outskirts of metropolitans and 'rural areas' focused on sparsely populated areas distinctively distant from the metropolis. Deeply rural, remote areas were an additional focus. Focus groups are able to provide a more nuanced qualitative understanding of socio-cultural issues that affect Internet access and use. Through the focus groups, the study sought to shed light on factors influencing Internet use and the strategies that people employ in order to be able to access and use data for different purposes.

The focus group discussions were designed to test the following hypotheses:

- The use of subsidised services only forms part of data use;
- People do not move beyond the use of subsidised services;
- Using the Internet first through subsidised services leaves people with a lesser understanding of the Internet.

To test these hypotheses, the study specifically sought to understand the following issues:

- The reasons for peoples' use of their top five websites and applications;
- Whether people are interested in using the Internet beyond their top 10 websites and applications;
- To what degree free or discounted access to the Internet affects the decision of new Internet users to go online.

Table 1 shows the distribution of focus across the four countries. In the project design, there were meant to be between nine and 12 focus groups distributed across the three geographical areas, with mixed male and female, as well as male- and female-only focus groups. Bearing in mind the size of some countries, Nigeria, having the largest population, resorted to having 12 focus groups. A total of 41 focus groups were conducted, with 409 participants all together. There were 11 female-only focus groups and 9 male-only focus groups distributed by location. With the exception Kenya, all other countries had deep rural focus groups. The locations of focus groups were selected based on their location within a country; accessibility to researchers, including knowledge of context and language; and whether the location met the geographical requirements.

	Urban	Peri-urban	Rural	Deep rural
Kenya	3	5	2	
Nigeria	3	3	3	3
Rwanda	2	3	2	2
South Africa	3	3	2	2

Table 1: Breakdown of focus groups by country

Source: Author's own from based on research design.

INTERNET AFFORDABILITY

As of the second quarter of 2014, RIA has been tracking the price of 1GB data basket for all operators in 49 African countries as part of the RIA African Mobile Pricing Index[1]. The 1GB basket comprises the monthly cost of 1GB data, based on prepaid data top-ups or bundled top-ups. It is converted to USD for comparison across African markets. The cheapest operator offering of 1GB of data, regardless of country, since the second quarter of 2014, has decreased from USD4.8 to USD2.3 as indicated by Figure 1. Similar trends are seen in the countries under assessment. However, for some the cost is unattainable. All of the countries under assessment showed prices being reduced as well, but did not offer the cheapest 1GB price in Africa.

Operators are increasingly facing competition from over-the-top (OTT) players like WhatsApp, which has resulted in a decline in traditional voice and SMS revenue. This has resulted in operators either launching innovative products on the market or seeking regulatory intervention against OTT players (Chair, 2016; Stork *et al.*, 2016). These products include subsidised data in forms of service specific bundles, bonus reward data and zero-rated data (Gillwald et al, 2016). Operators are aggressively competing to encourage the use of data services and to retain and attract customers. Subsidised data refers to when one has the option to use or access data without paying for the service or purchases a service and receives extra data for complete Internet use or a specific service. Fully subsidised services, such as zero-rated content from mobile operators, are mainly

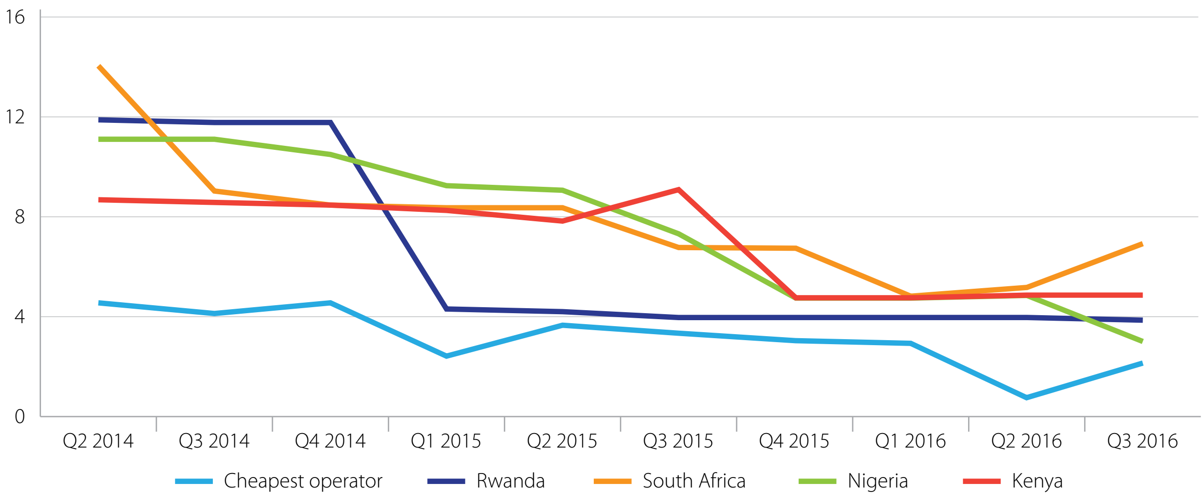


Figure 1: 1GB cheapest prices trend in Africa and 4-country comparison in (USD) Q22014-Q32016

Source: RIA African Mobile Pricing (RAMP) Index.

[1] https://www.researchictafrica.net/pricing/ramp.php

OTT services, such as WhatsApp and Facebook, as they seem more appealing on the African market, given the popularity of these platforms to communicate (Gillwald *et al.*, 2016). Through a supply side assessment of zero rating in Kenyan, Nigerian, South African and Ghanaian markets, it was found that all these strategies were often offered as part of a multi-pronged strategy to appeal to users as listed in Table 2. All the countries assessed offered some form of zero-rated content; specifically all of the non-dominant operators offered Free Basics.[2]

Data type	Key elements	Cost to consumer	Data variations	Examples
Prepaid data package	Characterised by the quantity or volume that the user purchases and the expiry date of the bundle purchased, i.e., validity.	Full cost on customer.	- Set volume of data above 1MB with validity that is daily, nightshift (between midnight and 5am) - Pay for unlimited Internet access for a set period - Combined-service top-up: user buys a combination of two or more services, without a breakdown of how much each service costs.	- Buy once-off 100MB of data valid at night - Unlimited Internet for 30 days - Buy 100MB data + 100 call minutes + 100 SMSs + 100MB for social media (or unlimited data for social media).
Rewards	Based on activities the user does that qualifies the user for a reward from the operator, extra data, extra SMS or airtime credit.	Customer does not pay directly for the service in rewards.	- Recharge certain amount = extra data - Recharge = accumulation of points.	- Recharge USD50 and get 150MB or USD100 of data before they have used the airtime for a service - For every USD10 spent, the customer gets one point. Once a customer gets 100 points, she or he can redeem the points for voice, SMS or data.
Zero-rated data	Applications or services that do not carry a data charge to the user's data package.	No cost.	- Social media sites - Educational sites.	- Zero-rated Free Basics or Twitter.
Service specific data	Buying bundles to use for a specific service.	Customer pays the cost for just accessing the service.	- Social media bundle - Music subscriptions.	- Buy monthly data for WhatsApp only.

Table 2: Mobile network data offerings to consumers

Source: RIA African Mobile Pricing (RAMP) Index (RIA, 2015) based on operator advertised products.

2 Free Basics is an application offered by Internet.org in partnership with mobile operators, which allows users to access the Internet sites on the applications without charges to their data (Internet.org - https://info.internet.org/en/approach/).

INTERNET MARKET OVERVIEW IN KENYA, RWANDA, NIGERIA AND SOUTH AFRICA

Overall, the state of Internet access varies from country to country but with a growth of people accessing the Internet in each country. Table 3 provides an overview of the market based on International Telecommunication Union Internet penetration data of 2015 and the RIA African Mobile Pricing Index. According to the communications sector report by Communications Authority of Kenya (CAK) for the period June to September 2016 the number of Internet users stood at 37.7 million people as at September 2016. These were the estimated users based on subscriber calculations, which may be problematic, as it counts SIM cards and devices, instead of individual users in an environment of multiple SIM ownership. There are three mobile operators in the Kenyan mobile market – Safaricom Kenya Limited, Airtel Networks Limited and Telkom Kenya Limited (Orange) – and one mobile virtual network operator, Finserve Africa Limited (Equitel). Safaricom is the dominant operator, with close to 63% of the market share (CAK, 2016). All four provide Internet services. In an assessment of the forms of products from operators, it was found that zero-rated, no-cost products were offered by all operators, with Wikipedia zero offered by all operators and Free Basics by Airtel and Equitel (Gillwald *et al.*, 2016).

In Rwanda, mobile phones have largely contributed to the increase of Internet use and penetration, particularly for the youth and low income earners (McKinsey & Company, 2014). On the data segment, the regulator reported a decrease in Internet subscribers as of June 2016, from 3,724,678 in the first quarter to 3,664,609. This represents an Internet penetration rate of approximately 33% (RURA, 2016). In spite of the quarterly decrease, taking into account International Telecommunications Union (ITU) data from 2015 cited in Table 3, Internet penetration in Rwanda has almost doubled over the last two years, albeit off a very low base. Compared to the other countries, it has the second cheapest 1GB basket price after Nigeria. MTN Rwanda is the dominant operator in the country, with close to 48% share of the market, followed by Tigo with 38%, then Airtel with 14 %. The Rwandan government champions ICT uptake as part of its development strategy. It initially launched public Wi-Fi initiatives in 2013 (Techcentral, 2013) and connected more than 400 buses as part of the smart Kigali initiative (Bizimungu, 2016).

The Nigerian telecoms market is evolving along its own particular path. Prices are declining and data services are improving noticeably (Gillwald *et al.*, 2016). As Table 3 highlights, it had the best 1GB price in the third quarter of 2016 following the removal of floor pricing, that is, the minimum a product may be priced at. According to ITU data of 2014, it has the second highest level of Internet penetration when compared to the other countries. According to the Nigerian Communications Commission, in the period ending December 2016 there

were 91,880,032 mobile data subscribers in comparison to 30,309 users on other technology, such as fixed lines[3]. MTN is the dominant operator in the market, followed by Globacom (Glo), Airtel and Etisalat. The mobile network operators accounted for 99.7% of all active Internet service subscriptions at the end of 2016, with the remaining percentage attributable to fixed wired/wireless providers (NCC, 2016). There are more rewards offerings on the Nigerian prepaid market from all operators than zero-rated services. Only Airtel zero rates Free Basics in Nigeria, however the popularity of the service has been low (Gillwald *et al.*, 2016).

South Africa's mobile market is characterised by a duopoly. The two dominant operators, Vodacom and MTN have a market share of 37.7% and 35.9% respectively (Khan, 2016). Cell C and Telkom Mobile are the third and fourth largest operators. Mobile data in the country is the most expensive when compared to the other countries under assessment. Public Wi-Fi has been seen as one of the ways in which provinces, through municipalities, may implement the national broadband policy. All operators provide some zero-rated data and personalised packages, which include service specific bundles and rewards offers to attract and retain customers. Personalised packages refer to products that consumers may get if they meet certain criteria, such as products for under-25s or a tailored promotion after dialling a USSD code (Chair, 2016). In the beginning of 2017, Vodacom, the dominant operator began to offer subsidised social media (Facebook) whereas before it had subsidised educational and career sites[4]. Therefore, in the South African market, Facebook may be accessed for free on either a the dominant or non-dominant operator.

Country	Internet Penetration % (ITU 2015)*	Network Operators (RAMP)**	USD Q3 1GB (RAMP)**	Subsidised data	Public Wi-Fi initiative
Kenya	46%	Safaricom, Airtel, Orange, Equitel	5.02	Yes	No
Nigeria	47%	MTN, Glo, Airtel, Etisalat	3.25	Yes	No
Rwanda	18%	MTN, Airtel, Tigo	3.91	Yes	Yes
South Africa	52%	Vodacom, MTN, Cell C, Telkom	7.04	Yes	Yes

Table 3: Overview of Internet supply

*ITU Individual Internet penetration %

**RIA African Mobile Pricing Indices (http://www.researchictafrica.net/pricing/ramp.php)

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3 http://ncc.gov.ng/stakeholder/statistics-reports/industry-overview#gsm-2

4 http://www.vodacom.co.za/vodacom/services/Internet/facebook-flex

Through a process of coding and analysis of country transcripts and reports, we developed themes arising from the data that would respond to the main query of why people use the Internet the way they do. This section discusses a number of themes common and different across all the countries, bearing in mind geographical locations and gender differences, where any appear.

MOTIVATIONS FOR INTERNET USE

"I use Internet for two purposes, business purposes and personal purposes. That of personal purpose is for research, educational aspect of it. For business purposes, people do call me to do that basically either for research or to send e-mails or another thing." (Rural male respondent, Nigeria)

The research sought to determine the motivations for going online, which included why respondents went online, what they accessed online – that is, popular sites visited – and how they accessed the Internet.

Why respondents went online

In an environment where voice and SMS tariffs are expensive, compared to data services, across all regions and regardless of location, users went online because of the ease of access to information and a cheaper option to communicate with in comparison to voice services. Information could be accessed quicker via the Internet

Global Communication

Respondent 1: "I think the Internet is a global way of communicating, I'm not sure though."

Respondent 2: "I agree..., that Internet is a universal way of engaging and interacting."

- Deep Rural Female Respondents South Africa.

Local Communication

"I started using Internet in 2009 by opening my first email account. My main motivation was to communicate with colleagues about work and related reports but it is also a good opportunity to get up to date information."

- Male Rural User Rwanda

Information Seeking

"I love knowing more about things because I'm a Muslim. If I want to know more about Islam, you know I cannot go to Saudi Arabia to go and be asking questions."

- Male Rural Respondent Nigeria

Fast Communication

"Before we used to write letters, take them to the post office etc... but now we just use the Internet and get prompt response, which is much cheaper."

- Female Kenyan Urban Kenyan

Curiosity

"...Because I saw older people using. Then I spoke to my parents who started buying for me the small phones a 'kaduda'. I later upgraded after resources ceased being a challenge."

- Kenyan Rural respondent

than having to wait to find out through other means. Respondents in both rural and urban areas did not have to travel to access information. Respondents' social contexts also influenced their motivations for Internet use. For both men and women in rural and urban areas, curiosity after seeing other people online spurred on their Internet use. Students or those in the academic field were motivated to find information related to their line of work or communicate for educational purposes, using e-mails or social media. Unemployed people were motivated to go on the Internet to look for jobs and market themselves, while entrepreneurs went online to search business-related information.

In line with the social context, one respondent cited that their line of work required them to be on the Internet, but their Internet use was only social media, "I started Internet last month ...The reason for using WhatsApp is that I am a leader at my work, so now you know the new life is about WhatsApp, WhatsApp" (male peri-urban respondent, South Africa).

As the literature pointed out, social media plays a significant role in driving Internet uptake. Socialising was also cited as a reason to go online, whether with local friends or getting to meet new people via social media platforms. Socialising on the Internet also meant finding romantic relationships online: "You can, for example, meet on Facebook with others ... on friend request, you do not know that person but at the end of the day you meet, chat and hit it from there" (female peri-urban respondent, South Africa).

Content accessed and used

The research aimed to ascertain the extent to which people make use of the Internet beyond particular sites. In querying whether individuals could name their top five sites, what became apparent was that the search engine, Google is most popular, followed by social media sites. Individuals could not name their top five sites but could state the different uses they have for Internet and the content they could find. However, the extent of content access was found to be based in the social and economic context. For example, in all countries the study happened to interview health professionals or those studying within the sector, who would research specifically for health information.

Table 4 highlights the variety in content accessed across the four countries. The search engine Google was perceived by respondents to be the most important site for finding information, as it is the common site across the four counties. According to a respondent in deep rural Lagos, "Google is the most important website on the Internet". It was the first starting point to search for news, fashion trends or any queries users had, with no other search engine mentioned: "Like if I need to access something I Google and from there I get it" (female peri-urban user in Kenya).

Facebook and WhatsApp are the most popular social media platforms and serve as a means to communicate as well as access information. Communication on these platforms is both local and

Nigeria	South Africa	Kenya	Rwanda
Google	Google	Google	Google
Social media sites	Social media sites	Social media sites	Social media sites
Local content	-	Local content	Local content
Entertainment downloads	Entertainment downloads	Entertainment downloads	-
Betting	-	Betting	-
Health	Health	Health	Health
Sports	-	Sports	-
Fashion trends	Fashion trends	Fashions trends	-
-	-	Biblical content	-

Table 4: Type of content accessed in countries under comparison

Source: Author's own based on focus group findings.

global. Facebook, for instance, is also used to access news. Social media is a strong motivation for Internet use. One respondent from the deep rural female focus group stated that:

"umhh … I think for me people use Internet because they want to communicate and they want to socialise. For an example I was never going to use Internet if it wasn't for Facebook and Google to set up my e-mail account".

In Nigeria only, use of another social media platform was found: 2go. However, 2go was popularly cited in one of the urban mixed focus groups, in comparison to rural and peri-urban. As one respondent put it:

"I will be with my friends and they will be discussing strange things that I don't know. They will be saying "WhatsApp", "Facebook", "2go", they will be talking, and chatting and I will be left behind. Sometimes my twin brother will ask me, "Do I like these things?" This thing continued to bother me until I now decided to tell him to open 2go for me." (Female respondent, urban Nigeria)

Local content, often cited as a challenge for Internet users, limiting their Internet experience, is more popular in Nigeria and Rwanda. In Rwanda local online news sites, such as igihe.com and umuseke.rw, and online public services irembo.rw are the most popular local sites. The government of Rwanda has been leading

the charge in ensuring ease of access to government content, hence the popularity of the online public service. The local online news site is seen as more reliable in comparison to international media. As one respondent stated, it has the "more updated news and it is the oldest private local online news in Rwanda" (female respondent in rural Rwanda). In Nigeria respondents access a diverse number of local content sites, such as Naijapals, a content site for downloading movies, music and catching up with celebrity gossip; naij.com, a Nigeria information site; Linda Ikeji, a blog site; Eskimi, an entertainment and dating site; and 9ja bets, a betting site.

Gender differences arose in terms of the content accessed, with sports and betting sites often being accessed by men while women tend to search more for fashion, style and online-shopping and health.

Business use

Some of the respondents saw the Internet as essential for enhancing business activities, specifically in Kenya, Nigeria and Rwanda. It is worth noting that respondents' occupations were not a criterion for selection. In South Africa, the selected respondents did not consist of entrepreneurs hence the use for business activities was not cited. Those who have their own businesses go online to seek information on products related to their line of work that would be used to enhance their business, whether in urban or rural areas, regardless of sex. As stated below:

"Concerning that sir, some people believe that so far you enter the Internet, you're looking for boyfriend or girlfriend. But as for me sir, I'm a builder. When I want to enter the Internet, I'm using Internet for my work… If I want to get any job, the site that I have never seen or anything that I don't even see in my work, like the sand, I will record the sand, when I get back to the site, I have a lot of people that are wiser than me, I will take it to them." (Rural male respondent, Nigeria)

While for many respondents the Internet provides a platform by which they can conduct business, one respondent in urban Kenya stated that they use WhatsApp and e-mail to interact with customers. Images can be shared with customers on products available and if any additional information is needed, it is sent via e-mail. Other respondents pointed out a marketing of products online as essential to their business. Respondents in peri-urban South Africa indicated use of online platforms, such as Gumtree and OLX for the selling and buying of second-hand goods.

Work-related use

Across all regions, Internet access is used to conduct work-related activities or to look for employment for those who are unemployed. By work, the study refers to those in some form of employment, rather than entrepreneurial. Respondents cited a need to go online to conduct work activities,

which include downloading or uploading work reports, responding to work e-mails, research on their job or communicating with colleagues. In rural Rwanda, interviewees pointed out a need to have access to their e-mail, in order to share work-related information. A land manager interviewed in rural Rwanda stated that they make use of the local tax website, as their job is to assist citizens to declare taxes.

With regard to searching for jobs, users stated that they make use of online platforms. For example, in South Africa and Kenya users make use of OLX or Gumtree to search for jobs:

"okay fine, I heard from people that if you Google something maybe you will get a job, and that if you go on to Gumtree and add your CV they will look for a job for you, all you have to do is add your qualifications, like what you are qualified for and submit your CV, they look for a job for you..." (Peri-urban respondent, South Africa)

The ability to use the Internet for this purpose was learnt from communicating with others who had made use of suitable platforms to seek employment. Some highlighted being content curators to support others seeking employment. One respondent in urban Kenya stated that they actually share job opportunities with others: "There is an initiative we run here called Jobs. So every day when I wake up, I look for jobs so I can post to these guys on Jobs office" (male urban user, Kenya).

Educational use

The Internet is used for educational purposes amongst the respondents across all regions. The educational purposes include students doing research, children doing school work and users gaining new skills. With reference to gaining skills, a respondent in Nigeria stated, "If not formal, at least it's better than nothing." Both female and male respondents who were Internet users were aware of the opportunity to learn from having access to the Internet. This was more pronounced in urban areas than rural areas:

"So apart from that when I visit the websites I can download pdfs – I can learn everything I want to learn. I can learn from my phone." (Female peri-urban respondent, Kenya)

Female respondents from peri-urban areas in South Africa and Kenya stated that they make use of the Internet to apply for further education: "When applying for a school you scan and e-mail the application" (peri-urban female respondent). There the motivation for information seeking is also specific to educational advancement. The Internet is also used for research on school projects for the users themselves or their children. One respondent stated that they learn faster by using the Internet to carry out assignments. When asked to clarify further they stated: "I go on to the website, www.google.com, then I put my assignment and I get it faster" (male urban respondent, Nigeria). A university student in Rwanda stated that: "I use Google and Wikipedia for my class assignments,

especially when in a presence of new word or topic that I have to learn about. As an engineering student, I also benefit a lot by reading conver.com to search for new design technologies". One rural respondent in Nigeria described Google as 'ifa', a free gift, as they could ask questions and get answers. With regards to children's work, one respondent from a peri-urban area in Nigeria stated that when their child is given homework on a particular topic, they have to google it. Thus use of the Internet for education purpose is a means to assist parents in assisting their children.

While those with an interest in learning more skills via the Internet are extensive users, the need to learn new skills via the Internet is not as common across deep rural and rural areas. Rural and deep rural Internet users have more interest in learning what the Internet is about and how they can make better use of Internet access.

Social connections

The Internet also provides a platform through which people can connect with other people. The way in which the Internet is used to make these social connections varies. A respondent from a deep rural area cited using the Internet when they want to socialise. Social connections are perceived as linked to increasing current connections with friends and family; meeting new people; finding a romantic partner; or reconnecting with friends and family. Internet users stated that they communicate easily through Facebook and WhatsApp to chat with family and friends.

Social forums online provide a sense of community, where individuals are able to interact on specific topics. Respondents in Kenya, for example, cited accessing specific content from 'Kilimani mums and Kisumu dads', where listeners post issues that affect them and their family, to get advice from the other listeners. The importance of being connected to other people was expressed well by one respondent, who at that time did not have access to the Internet and therefore classified as a non-user:

"Whenever I'm online it seems like I'm in a forum like this discussing because in the house you have many opinions. Many people will talk, chat and send their messages. I learnt from there very, very well. During that time if I have challenges as a youth then, once I am online I will see those challenges discussed..." (Female urban respondent, Nigeria)

These forums provide a source of free advice from people who understand the social context, whilst for others the Internet provides a mean to reconnect with loved ones. In South Africa, one peri-urban respondent stated that: "For example, you have family you looking for but yet you know their name and surname but then you have no idea [somebody talking] as to where you will find them and that's when you search for them...". Dating was mainly cited by respondents in urban and peri-urban areas as a reason for being online. Respondents stated that they meet people

online, after receiving a friend request, meet up and then eventually date. One male respondent in urban Rwanda stated that they go online with the following purpose: "I started to use the Internet by opening a Facebook account in 2010. I was mainly searching for a suitable girl to become my girlfriend."

Financial transactions

Only in Nigeria did the study capture Internet use for the purposes of financial transactions. Many participants across all income groups said they use the Internet for financial transactions and professed their satisfaction with the ease of this activity. One user in Nigeria said: "I use mobile banking. If I want to pay now, I can do it now even to recharge my phone. I don't normally buy air time [in any other way], I buy from my account."

Financial transactions done online by participants include e-commerce, electronic banking, and wire transfer, among others. One Nigerian male participant illustrated his experience with transferring funds in this way:

"Now I used to stay in my house and do it whether in the midnight or anytime of the day. It's even better in the night to transfer fund from your account to somebody else's. I no longer go to Enugu and take the risk of travelling. Going to Enugu I'll be paying more. From here to Enugu going and coming back will take me N500 ($1.58) straight. But I will stay here, do the transaction and pay only N105 ($0.33)."

Internet access devices

The main point of Internet access for most respondents is through mobile phones, in particular smart phones. In comparison to a laptop or computer, phones are seen as cheaper for Internet use.

Respondents in urban areas and peri-urban areas cited that they also access the Internet via their personal laptops, tablets, personal computers and computers at libraries, schools or Internet cafés. One urban user in Nigeria who is an academic, stated that they need multiple devices for convenience while they work:

"Like if my phone is with me I use that or when I have my ipad around and I do that. When I want to do serious academic work where of course I have to download and all of that, I rely on my laptop. I probably have to be in my office, [there] I use my modem." (Male respondent, urban Nigeria)

In the South African province of the Western Cape, peri-urban respondents indicated a use of computers at public institutions, either at the local school or the library. These facilities are free and open to the public. The area where the focus groups were conducted has the provincial government Cape Access Project, which provides computers and Internet access at public libraries[5].

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[5] https://www.westerncape.gov.za/capeaccess/

DATA-SAVING STRATEGIES

Subsidised data services are one of main points of interest in determining the way in which people make use of the Internet. However, the study found fully and partially subsidised data to be part of the several ways of data-saving strategies. Table 5 summarises data strategies unique to each country by regional differences.

Zero-rated data

Awareness of zero-rated services was found more in urban and peri-urban areas than rural areas. Respondent access zero-rated Free Basics: "Yes you can download Free Basics, there is an App called Free Basics that you can download, it is also free" (Peri-urban respondent, South Africa). The presence of the zero-rated service Free Basics on a network has led some long-term

	Urban	Peri-urban	Rural
Nigeria	- Prepaid package data - Reward data - Service specific bundles	- Zero rating, - Prepaid package data, - Reward or promotional data - Tethering	- BlackBerry plans - Reward data
Kenya	- Prepaid package data - Promotional mobile data - Modem data - Tethering	- Promotional data - BlackBerry data - Zero rating	- Prepaid package data - Rewards data
South Africa	- Prepaid package data - Service specific bundles - Rewards data	- Rewards data through operator promotions - Mobile tethering hotspots - Mobile airtime - Zero rating - Service specific data - Prepaid package data	- Prepaid package - Rewards data through operator promotions
Rwanda	- Rewards data through operator promotions - Modem data - Prepaid package data	- Rewards data through operator promotions - Prepaid package data	- Rewards data through operator promotions - Prepaid package data

Table 5: Mobile data-saving strategies across four countries by location

Source: Author's own from Research ICT Africa (RAMP) Index 2016 www.researchICTafrica.net.

Internet users to switch operators in order to enjoy the benefits. These respondents were located in urban and peri-urban Kenya and South Africa.

R: It's free

M: What do you mean it's free, you mean free, free, free?

R: It's free, free, free.

M: As in airtime showing zero, zero, free?

R: Yes, because I ported today to Cell C and this lady said...'

(Peri-urban respondents, South Africa)

While from a supply side, zero-rated service means that a user does not have to pay anything to access the site, Rwandan respondents indicated a different perception. For example, respondents cited the bundled offers captured in Table 6 as zero-rated offers. However the respondents would still have to pay something in order to access the unlimited service, thus it is partially subsided but not zero-rated.

Bearing different contexts in mind, for various reasons zero rating is not as popular amongst new and old Internet users. Some respondents, in particular in rural areas claimed to have not heard of the service, even though they use the service provider who offer the service. A respondent in rural Nigeria cited a lack of advertising, which meant people were not aware of it. Still in Nigeria, one respondent stated he has used it but "couldn't go deep with it" and another stated that "people that don't want to take Internet; they'll be okay by that because they will not pay money." An all-female, peri-urban focus group in South Africa claimed not having heard about it. With the exception of Rwanda, all other countries had respondents voicing general mistrust of free services: "I think I have heard about it, it's an app but I have never trusted it because I do not believe in free things" (Male Urban respondent, Kenya). New users were not motivated to go online because of the free service:

Airtel Daily Bundles (Age Limited: 16-25 years)					
Bundle	**Price FRW**	**Data benefits**	**Subscribe via USSD**	**Subscribe via SMS**	**Validity**
Daily	50	60 MBs+unlimited Whatsapp	*222 *30#	Send 30 to 222	24 hrs
Daily	100	122 MBs+unlimited Whatsapp	*222 *100#	Send 100 to 222	24 hrs
Daily	150	186 MBs+unlimited Whatsapp	*222 *150#	Send 150 to 222	24 hrs

Table 6: Example of data bundle with social media add-on

Source: Airtel Rwanda http://africa.airtel.com/wps/wcm/connect/africarevamp/rwanda/home/personal/internet/special-offers/data-bundles

"I think those free things to be honest do not motivate us to use the Internet to buy data. Personally speaking those things do not motivate me. Those free data and what you call it, the Internet shark swallows it very quickly." (Urban male respondent, South Africa)

Prepaid data packages

As mobile data is the most popular means to access the Internet, consumers manage their data through use of prepaid packages that come in different forms from their operators. From the report findings, respondents make use of monthly bundles or annual data; weekly or daily bundles; promotional bundles; reward bundles; or service specific bundles offers from their mobile network operator, BlackBerry plans.

Monthly prepaid data packages were found to be used more by urban and peri-urban respondents. On further analysis, those who use longer-term bundles are mainly urban female. One female respondent in Rwanda stated that, "I am enjoying a bundle of Rwf 3,000 (USD 3,71) per month available on TIGO that normally cost Rwf 4,000 (USD 4,98) if I pay on weekly basis." The respondent recognised the value of purchasing data with longer validity periods in comparison to daily or weekly. One male respondent from urban South Africa has a yearly data plan from his mobile operator but this is as a result of purchasing a particular data sim: "I use MTN. They have a data SIM card. I bought the data SIM card for 12 months for R100 (USD 7,7). 200MB for 12 months. There is a top-up option."

"Sometimes I normally subscribe N1000 Etisalat but in the process before the month ends they will tell me that my data has been exhausted without using it. Do you understand? I decided not to use that N1000 because it will be a waste for me. I am now using one week or three days..."

- Peri-urban student, Nigeria

The BlackBerry monthly service is popular in Nigeria, except amongst rural females. In South Africa, only one respondent makes use of it. BlackBerry monthly subscriptions are devised to offer BlackBerry Internet bundles that provide a wide range of Internet services but can only be used in the device.

Levels of income determine whether respondents can afford to purchase a longer validity bundle, which tends to be more expensive, than a shorter validity bundle. A rural male participant from Kenya indicated that he can only afford to spend Ksh.20 (USD 0,20) per day on Internet, which he divides between Facebook and WhatsApp. A student in peri-urban Nigeria put it as:

"Sometimes I normally subscribe N1000 Etisalat but in the process before the month ends they will tell me that my data has been exhausted without using it. Do you understand? I decided not to use that N1000 because it will be a waste for me. I am now using one week or three days..."

Apart from the means of buying longer validity bundles and concerns with the service expiring before the time, some respondents stated the lack of places where they could purchase longer validity bundles. Specifically, in a peri-urban area in South Africa, data bundles were only available at the mall, which was a distance away from residential locations and therefore respondents generally bought small sums of airtime and converted them to data bundles. Some respondents noted that they would only buy data bundles directly from data service providers or retailers when they were at the mall.

Peri-urban and urban Internet users demonstrated awareness of different data saving strategies by taking advantage of rewards data (data that one receives after purchasing a service from the operator). Rewards data is available in different forms, for example, as a reward for recharging one's phone with airtime, as is the case on specific networks in Nigeria, Kenya and South Africa.

"Airtel does give extra bundle. In fact, I was not concentrating on it until a particular time when I said "what is this message that comes to my phone every time?" So I tried to access it. At the end of the day, lo and behold from that day I was able to say what I had as point was about N6000 (USD 19), enough for me to have my one-month data plan that I probably pay 2000 naira (USD6.4) for". (Male respondent, urban Nigeria)

Some bundled rewards that respondents access offer extra unlimited Internet on top of the recharge, while others offer use-specific bundles. As one peri-urban female in South Africa pointed out: "You do get free data but it's only for music..." Social media popularity is also rather extensively pushed from a supply perspective and, where popular amongst all respondents, as part of their data management strategies. Social media bundles are a popular add-on to rewards from operators or are provided for purchase. Respondents get bonus data for WhatsApp, for example. This is more pronounced in urban and peri-urban areas, as network coverage sometimes does not extend to rural areas in Kenya, Rwanda and South Africa. In Rwanda the added-on service of free social media is a critical means of ensuring Internet use. One female respondent in the urban areas stated:

FR: I use an Airtel bundle of Rwf500 (USD 0,61) for a month with zero-rated services, including Facebook and WhatsApp.

M: Would you still like it without the zero-rated services?

FR: Hhha! If subsidised data is stopped, I can't stop using Internet but the time I spend will be reduced.

Some respondents indicated using night-time data as this is cheaper from midnight till 6 or 7a.m. Male users

in peri-urban and urban South Africa cited preferring to make use of their Internet service at night when it was cheaper, for example: “I use Cell C. I use the night surfer option on both Cell C and MTN”.

Awareness of promotional services among respondents indicated users who are constantly looking for ways in which to save on data. Some respondents rely solely on free data to access the Internet, as was the case for a female peri-urban respondent and a rural male respondent. By ‘free data’ they meant the data rewarded by the operator when they recharge. One respondent in South Africa stated she just buys airtime, knowing her network provider gives her free data. But for others, the perception of free services is negative, and as respondents pointed out, it’s not free as you still have to pay to access it.

“I now went back to that woman ... She said, “Sorry madam, you I’ll have to recharge.” I told her, “But you told me when I put my SIM I’ll see the data?” She just said, “Don’t be annoyed, just recharge.” So they were just lying and they were fooling themselves.” (Female respondent, urban Nigeria)

Mobile alternatives

Internet cafés

While for main access and use of the Internet, mobile data provides a constant point of connection, Internet cafés and free Wi-Fi are sought after options. Some respondents in Rwanda, Kenya and South Africa cited Internet or cyber cafés to be alternative means of Internet access and use. In Rwanda, Internet cafés are the secondary means of accessing the Internet:

“Also cyber cafés in Nyamirambo are still very active and get good enjoy the increase of customers due to the use of government website that provides public services known as IREMBO. People prefer to use cyber cafés in Nyamirambo to access those services as it is more convenient for them, and in addition they can also get printing and copies services as well as scanning services from the cyber cafés.” (Male respondent, Urban Rwanda)

Internet cafés are popular because they can be used for an extended time, compared to when on a mobile device. They are more useful when users need to engage in data-heavy activities, including downloading or going onto YouTube, or for other services, such as scanning or CV typing. A few of the respondents own personal computers and laptops, making the Internet café a further means for access. Two respondents in South Africa and Rwanda stated exclusive Internet access and use through Internet cafés.

In Kenya and South Africa, more respondents make use of Internet cafés in urban and peri-urban areas, than they do in rural areas. This is because Internet cafés are not as easily available in some areas and require users to travel. Cost to use Internet cafés was also cited as a deterrent. One respondent in South Africa cited that the Internet café costs more than does a smaller mobile Internet bundle (thirty minutes of use) and they

still need to travel to it. Women in Kenya cited Internet cafés as inconvenient: "… we are teaching … which is challenging, particularly for women who are using via mobile phones since cyber cafés are not convenient". Another challenge and hindrance to using Internet cafés is lack of trust in security of information.

Free Wi-Fi

Free Wi-Fi was found to be popular in all countries across regions and is accessed from places of work, universities, schools, hotels, restaurants, pubs, shopping malls, Internet cafés, public transport or private individual networks. Where free Wi-Fi is available at schools it usualy only available to students and staff only, thus limiting those who could make use of it.

Commercial spots, such as restaurants and hotels are often the most popular spots for Wi-Fi access. However, these are not always convenient. As a female respondent in a peri-urban area in Kenya stated, "But you see, not everyone goes to a pub. I cannot go to a pub and start using the Internet." Another challenge is that in some commercial places Wi-Fi is secured with a password and to access the password, you have to use their services. "It can be accessed at the restaurant; they give you the password, if you have bought something inside" (Male respondent, peri-urban South Africa).

In Rwanda and South Africa, where there are government supported initiatives, free Wi-Fi is mainly available in urban centres. In Rwandan rural areas, Wi-Fi is accessible at the local administration offices, known

"I'll make an example. I went out with my children, we went to Shoprite. My son is mostly based on it and fond of it and he came back and told me 'Mummy, I saw wireless free here!' I said 'hmm, wireless free here? Where? Which of it?' Alausa's wireless is always open!"

- Urban female respondent, Nigeria

as sectors, and at some businesses, such as hotels and agro-processing centres. In rural South Africa, Wi-Fi is available at schools, restaurants or shopping malls, as well. Rural Wi-Fi access requires travel to the nearest access point, thus limiting rural respondents benefitting from Wi-Fi. Another challenge is that some of free public Wi-Fi sites do not work, as was the case in one of the study's locations in South Africa.

In Kenya and Rwanda, public transport also serves as a point of Wi-Fi access. In Kenya, some public transport vehicles (matatus), offer free Wi-Fi once one boards. This allows for convenience during travel. These matatus are so convenient that some of the respondents wait to board a specific one. However, challenges of using free Wi-Fi on the matatus include low phone battery, inactive Wi-Fi or taking too long to log in. In Rwanda, some rural respondents said they occasionally access Wi-Fi on the bus.

Some respondents rely on private Wi-Fi, where a few have access to the password. Respondents also looked out for unsecured networks. One female respondent in Nigeria cited that her son had been sharing the Wi-Fi password with staff and he ended up running out of Wi-Fi bundles before the month was over. Other participants have established some form of social connection to access free private Wi-Fi. In Kenya, one respondent stated that when he does not have bundles, he visits a neighbour who has Wi-Fi and stays for as long as he needs to use the Internet. In South Africa, respondents stated sharing office Wi-Fi passwords with friends, so they can use the service. Creation of private Wi-Fi was popular through mobile phone tethering, known as 'hotspots'. Internet access through mobile tethering was done for the purposes of sharing data with friends:

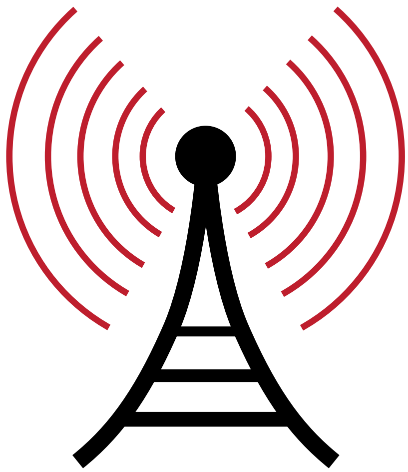
"The thing is, I use Cell C [giggling] and Cell C has this thing of using WhatsApp for free and Facebook and since then my friend does not have data, I then have opened a hotspot for him using my data". (Male respondent, peri-urban South Africa)

Tethering provides a challenge, however, as some respondents described having had their data accessed without their knowledge or making use of the hotspot without permission. In Kenya, one respondent said that she uses friends' bundles without their knowledge by strategically ensuring that she is situated near friends with tethering capabilities to be connected automatically.

Free Wi-Fi serves as a cost saver, without having to pay for the use of an Internet café. Those with access to free Wi-Fi during the day from their workplaces or schools download data, research and look for employment while saving on mobile data costs. A South African respondent stated:

"...because it costs money at that Internet shop because it will cost you lots of money which I don't have that money but if you go to K-Access, you are then able to download for free, they don't want your money, therefore you can access it and apply to study or to try get work."

Respondents also stated that they switch off their data in order to save their data bundle and switch it back on when necessary. This was a way to save data from applications that may be running in the background whilst they were not using their phones.



FACTORS INFLUENCING OPERATOR CHOICE

Some respondents have a wide choice of network, while others only have one or two operators with decent coverage. Figure 2 illustrates the network operators within the four countries where the study was conducted. Users who can choose between different operators benefit from diverse promotions and cheaper prices. In this section we discuss reasons why respondents chose their service provider.

Quality of service

Quality of service is a determinant in selecting a mobile operator, even if it is not the cheapest. Quality of service is understood as signal strength of network and speed of service. Service providers that offer a better quality of service are the dominant operators in the market: MTN in Rwanda, Safaricom in Kenya and Vodacom and MTN in South Africa. Nigeria is the exception, as different regions prefer different operators, depending on their reach.

Signal quality is greatly affected in rural areas. In deep rural South Africa, one male respondent highlighted having to switch to the dominant operator in the market "because I always struggled with reception. Vodacom has a stronger signal than MTN." The same problem is experienced in deep rural Rwanda. All participants in the Kenyan focus group



Figure 2: Mobile network operators used by respondents in all countries

had Safaricom, the dominant operator. With better levels of investment in remote areas, dominant operators are likely to be available everywhere, benefitting rural users. However, they are often without competition within these areas, thus keeping users locked on a network.

Speed was of great concern in urban and peri-urban areas, with users indicating they select faster networks. In rural Nigeria, a male respondent stated that he had changed to a different operator because it was faster. Female respondents in peri-urban Nigeria cited that their network was the best because of speed:

M: For ETISALAT users, so tell us.

FR: For me, that's the best network for me.

M: What makes it the best network?

FR: Because it's faster.

Multiple SIMS

The stability of good quality networks is highly sought after; some make use of multiple sim cards to supplement the often expensive dominant operator.

"I come from Katoloni [deep rural area]. So when you use Airtel there you must use a 2G phone and it still refuses to download. But if you put Safaricom, 3G or 4G it is fine. Things download but your bundles really go. But if you compare those two, if you want to post something that is needed quickly, Safaricom will be more helpful to you than Airtel. But also Airtel its advantage is that when you are at a place where its network is good, its bundles will sustain you for much longer." (Male participant, semi-urban Kenya)

Ownership of a SIM card is rarely limited to one in the countries under assessment, with the exception of South Africa, where a large number of respondents only have one SIM card. In the other countries, extra SIM cards are necessary for maximising on data options and supplementing the main SIM card. In Kenya for example, all respondents use Safricom. The secondary SIM cards, Airtel or Orange, are only used to access cheaper data offers. In Nigeria, one participant claimed to have 9 SIM cards, with his main challenge being a lack of devices to use them all:

"Presently, I have 9 SIMs. Of all the networks, all of them are good. My only problem, is the devices. Thank God, we have androids that use 2 SIMs. If I have more androids, I'll use all the SIMs, they are all good."

SIM switching for network availability in Nigeria is popular. One respondent in the rural areas cited they switch to a different operator when their network 'disappears' from the initial one. In Kenya and Rwanda, particularly in the urban areas, multiple SIM cards are used in different devices. Some respondents have one SIM to access the Internet via their laptop or computer and another for their mobile data: "I use Safaricom first because it has bundles of five bob, 10 bob and it doubles up like that and sometimes I use orange. Orange I use on my laptop because I told you it has an offer of daily unliminet" (Urban male Kenyan respondent).

Internet users also stated they select different operators based on the benefits they can get from the service provider. Multiple SIMs are a means of saving, and are used for different purposes. For example, one SIM card will be for calling purposes, in order to benefit from same network calling and texting. Another SIM will be selected because of the data received, in order to conduct research, an extra SIM might be bought to benefit from data promotions and for network stability.

"I use MTN and Airtel. I chose MTN because its connection is fast, Airtel because is cheap and has affordable bundles. When I am broke I use Airtel But the problem is that I am limited to what I can do with those bundles." (Female respondent, urban Rwanda)

Network selection is also based on the fact that one can benefit from promotions or that friends and family are on the same network. This was particularly interesting in a deep rural community, in South Africa, where respondents used the second dominant operator in the market for the reasons stated. In Rwanda, participants preferred to use Tigo network, for example, because of the number of promotions that they could benefit from.

"I use multiple sim cards: I like Vodacom for power hour and MTN, when I buy airtime they give me free minutes, it depends when you finish recharging, depending on the price plan that you chose and love Cell C for WhatsApp bundle"

- Peri-urban male respondent, South Africa

Loyalty

While all the factors above indicate many users look at benefits offered by service providers, other users remain loyal to a specific network. Respondents pointed out that the network they were on was the first one they had ever joined when they first started going online and they would rather not change networks.

Even though number porting does occur in South Africa, one respondent, a peri-urban female stated that: "Vodacom is not perfect it is because it is the number I have had for a long time, I do not want to lose the number but Vodacom is not the right network for data, it is expensive." Unfortunately, awareness of number portability was not probed further.

Other respondents stated their network is cheaper compared to other networks on the market, despite being very well aware that the network quality is not up to par: "plus when you go out to the back of the yard, you lose network then when you're inside it's back [laughter] I love it regardless" (Female respondent, peri-urban South Africa).

BARRIERS TO INTERNET USE

Users and non-users face similar barriers that impact on Internet access and use. In this section, we discuss barriers faced by users and non-users and highlight gendered issues arising.

> **“Network is one great challenge, then the cost. You want to download a book, before it is complete you hear a message ‘tititit’ you are running short of bundles, the bundles are almost depleted. The cost is taking a toll on the users. And then the cost of the gadgets, many would want to but the phones are costly, so you go for the small one ‘katwin’ (twin SIM, a feature phone) you try to do anything it tells you insufficient memory. You have all sorts of limitations.”**
>
> *- Semi-urban femal respondent, Kenya*

Affordability of data

Cost for both the Internet and the non-Internet user impacts on how one may make use of the Internet. Cost is related to how much one has to pay for Internet access and cost of devices. Affordability of Internet bundles remains a challenge for Internet users and non-Internet users. A male rural respondent in Nigeria stated not having bought data in the last three months as he could not afford it. This is further echoed by respondents stating that larger data bundles are costly and need operators to reduce their prices for data. A South African male urban user stated: “Data is very expensive in South Africa, especially during the day, it’s killing us”.

As a result, short-term bundles form part of data saving strategies but their limited time validity and smaller bundles mean that users have to constantly buy data.

“The problem is you can subscribe the data from MTN, the only problem is they give you at least for 3 days [to use your bonus data]. If you recharge with N1750, you can call, you can send SMS anyhow, but you get 50MB, and that 50MB you must use it in 3 days.” (Female respondent, Nigeria)

For some respondents, it came down to choosing whether to spend money on data or on basic necessities. For one South African respondent in a deep rural area, data was a necessity they had to sacrifice for. Other respondents in South Africa and Kenya stated they would rather use their money on basic necessities than for data, claiming a lack of interest in using the Internet. One male respondent from rural Kenya cited that the money he earned was not enough to buy data: “You see what you work for is only enough to eat for the day and you wake up the next day to start all over again. So you don’t get extra for surfing. It would be nice if people get that free

Internet because people would be able to Google". These sentiments were echoed by female rural South African participants who stated that they could not afford to part with the little money they had.

'Big phone' device affordability

The lack of devices was a challenge for both Internet and non-Internet users. Internet-enabled phones – specifically smart phones, known as 'Big phones' in Nigeria – were seen as necessary to be able to access the Internet. As indicated earlier, one respondent only made use of the Internet café in Rwanda because they did not have an Internet enabled device. As a female respondent in Nigeria stated, "I have small Nokia phone, I don't have money to buy a good phone, laptop, all these things". The lack of devices impacts on use, in particular where it is a requirement for certain activities. This was highlighted by an older female user who pointed out the challenges of government initiatives that require online registration: "You will find out that other people do not have Internet abled phones; they are still using the old ones. Even last time they said we must register Grade 1 and 8 on the Internet, to go online; there was a problem with many parents."

Replacing phones that have been damaged is another challenge for users, as highlighted by some respondents in Nigeria, who stated they had not been able to replace their mobile phones that were damaged. A male rural respondent stated he had sold his phone and replaced it with a simpler phone. Phone sharing was a solution; one rural respondent used his friend's phone while another used her partner's device to overcome this barrier.

Content concerns

"The person that formed the group made a comment and said this forum is not meant for rubbish post because the person just posted one video that scared people and that night I couldn't sleep. When I just opened it I hear zooooom like a witch and wrote the person that formed that forum that "What is going on here? Didn't you see this thing somebody is posting." (Female respondent, urban Nigeria)

Internet content that one may be exposed to and can access was cited as a barrier for both Internet and non-Internet users and was highlighted as such by especially women. Unsolicited content deters most female users online as they often receive messages via social media platforms that make them reluctant to use the Internet. One female respondent from peri-urban Nigeria stated that she was not using the Internet because of the bad things she learns from social media. Another female participant from rural Kenya stated: "Sometimes even when you want, you just cannot cope with the "bad" information and pictures found there. People open Facebook then they close because of such information. Also people watch bad videos. This makes women to just opt out even when they want".

> **“The information going to the Internet should be controlled. The youth should be well informed. Some schools do not allow children to use phone in schools to avoid access to this kind of content. If this inappropriate content can be removed…”**
>
> *- Rural respondent, Kenya*

Misleading content was highlighted by both male and female users as a deterrent to Internet use. In South Africa, concerns around misleading content were related to individuals misrepresenting themselves after having interacted on social media. In particular misleading representation was associated with dating, as one urban female participant stated that someone on a dating site tried to steal from her. In Nigeria, fake news posed a risk to Internet users as they were not sure which source they could trust. Users were more aware of the possibility of fake news on social media than on search engines, specifically Google:

“But search engine that you can use for academic purposes, Google, if you get something that is not genuine, it will really pain you, and that would bring suspicion, generally. That is, you will start asking yourself, does it mean that Internet can give me fake information?” (Male respondent, rural Nigeria|)

Content concerns were also closely linked to fears over children’s use of the Internet. The question is often about protecting children from the Internet or engaging them on online safety. Participants indicated that parents could opt not to buy their children devices, ‘making innocent kids know what they should not and cause drama’ respondent, urban Kenya). The appropriateness of content worried respondents, with some suggesting ways in which content may be monitored:

“The information going to the Internet should be controlled. The youth should be well informed. Some schools do not allow children to use phone in schools to avoid access to this kind of content. If this inappropriate content can be removed…” (Respondent, rural Kenya)

Privacy and security concerns

Privacy and security impacted on the extent of use of the Internet for all users. Physical security, financial fraud, hacking, harassment, slander, stalking and surveillance were privacy and security concerns mentioned by all respondents. However, these issues were more predominant for urban and peri-urban users than rural users. Kenyan users were concerned about having their devices stolen, opting to use a cheap feature phone (mulika mwizi or Kaduda) and only carrying the smartphones when they need Internet access and have plans to visit places with free Wi-Fi.

For some of the respondents, privacy was an issue, and they expressed concern about protecting

passwords for websites and banking details and about hacking of private e-mails and social media accounts. In particular, they had concerns about malware that could be used to steal information. A peri-urban South African respondent stated, “On Google there are Spams, there are Trojans uhm…all those, people who are going to hack the…from your account, it is not safe”. In Nigeria, users were greatly concerned with fraudulent access to banking information, as one urban female respondent shared a story of having money deducted from her account after having made an initial payment on an antivirus site.

Surveillance in the context of community or family members observing what one does online or what ended up online was cited by some users as a problem. Some users opted not to use social media, as people would ask why they posted what they did. One urban respondent in South Africa cited that, “Some people fear ending up losing important things, such as respect and rights to be elected because of their stories and photos on the Internet”. Surveillance for political reasons, either from government or community, was raised in Kenya as well. A female respondent whose brother was a politician cited that she had had to leave social media because people were harassing her online. In relation to government, one Kenyan male peri-urban respondent put it:

“Of course like when the government sets some very harsh policies regarding the use of the Internet for example. They say that you do not send some type of messages; you do not send some type of messages using the computer. Now they fear using the Internet because they may be captured in the process.”

Gendered issues

In looking at Beyond Access issues, gender issues play out predominantly as barriers to Internet use. Time to use the Internet and time spent online is a challenge for women in family settings. As the quote below reflects, the fact that women have other family responsibilities means they cannot spend as much time as they want to online. The Internet, specifically social media, is seen to be a threat to relationships by both men and women. In rural areas, women reported their partners refusing to allow them to be on Facebook, while in peri-urban areas men and women recognised the tension from being online as being

> **“For instance a woman in the village even if she wanted to use a cyber she will not do that. Imagine being in the cyber at 7pm and you are expected to be at home cooking, taking care of cows etc. Even if you have a child abroad and you want to communicate with them, it becomes very difficult…”**
>
> *- Peri-urban female internet user, Kenya*

problematic to relations. A male respondent in peri-urban South Africa questioned: "No, my point is what is she going to do there, what do married people want on WhatsApp?" However, this question was posed in a mixed focus group and female respondents pointed out that the concern went both ways.

In rural areas, power relations between men and women impacted on Internet use for women in particular. In Kenya, one respondent stated that women fear their husband's response to them using the Internet. Respondents in rural South Africa and Kenya said that partners feel uncomfortable with them being on social media sites, due to jealousy or fears that they will be unfaithful: "I also do not go on social networks at night because that is creating problems to my relationship. I stopped him from being on WhatsApp at night, so I had to do the same."- Female respondent, deep rural South Africa.

Sexual advances were perceived more as irritations by men. Male respondents in South Africa stated that they opted to block people, male or female who were trying to have a relationship with them. This was a different experience for female users. One female peri-urban respondent in South Africa actually resorted to changing numbers after having received sexual advances from a stranger.

Electricity

"The issue of electricity is really restricting us from doing what we really want to do with our phones because we must always try to preserve the batteries." (Female respondent, deep rural South Africa)

In rural areas, electricity was cited as barrier to Internet use. The time that users can spend online is limited as they have to take their phones somewhere else to power them up, especially overnight. In Kenya, although household electricity in the rural areas is not a challenge due to the 'Stima Mashinani' (grassroots electricity) initiative, smartphones require constant recharge. Thus Internet users need either to have a portable charging facility or to use the Internet in a place where they can charge their phones.

BARRIERS SPECIFIC TO NON-USERS

Issues specific to non-Internet users came out from the focus groups. Illiteracy is perceived to be a challenge for non-Internet users, as one respondent from rural Rwanda said: "I have dropped out school in P3 so I cannot read and write therefore I am not able to use the Internet." Lack of content in local languages

"Because, yes, just like what he said now, you can see many people, illiterate ones, that use smart phones, but they don't even know where to touch and get the Internet. They only receive and make calls, just to receive it as fashion."

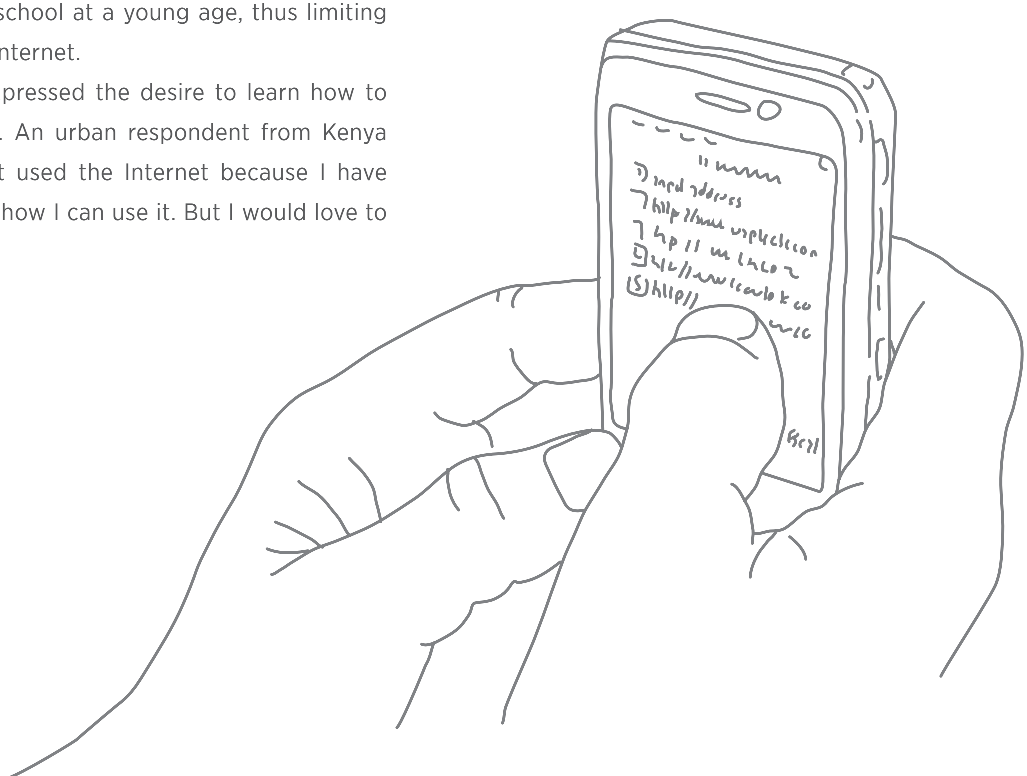
- Rural male, Nigeria

hinders other non-users from being able to make use of the Internet. In Rwanda, respondents in rural and peri-urban areas, both male and female, cited language as a barrier that limits operating the device or reading the content.

Apart from illiteracy, digital skills limited Internet use, in particular users who have devices that are able to access the Internet. A male responded in rural Nigeria stated, “We are not computer literate during our own time; we are just learning even those who want to use it. But the problem is some don’t know how to operate it”. In rural areas in particular, and in some instances peri-urban and urban areas, respondents stated not having received any form of training on how to use the Internet. In Rwanda, specifically rural areas, some female respondents had dropped out of school at a young age, thus limiting their use of the Internet.

Non-users expressed the desire to learn how to use the Internet. An urban respondent from Kenya said, “I have not used the Internet because I have not been taught how I can use it. But I would love to know how I can use it.” The desire to gain digital skills may definitely be tapped into by policies that focus on digital skills training, specific to Internet access and use. Interestingly in Kenya, some women stated that they relied on their children to teach them how to use the Internet as the children had more time than other adults.

Accessibility in terms of one’s physical wellbeing impacts on access. An elderly female respondent in South Africa stated: “I don’t want to lie, I no longer see very well, I would love to use Internet but I can’t keep up. But I am using a smartphone.” Although this issue was not probed further, it would have been interesting to assess the disability functions on her device, specifically related to visual impairment.



CONCLUSION

The study tested the following hypotheses:

- the use of subsidised services only forms part of data use;
- people do not move beyond the use of subsidised services;
- using the Internet first through subsidised services leaves people with less of an understanding of the Internet.

Using subsidised data forms one of many strategies to use the Internet, confirming the first hypothesis. However, the second hypothesis was not confirmed, as respondents moved beyond subsidised data. Concerns that zero-rated data, such as Free Basics locks users into one application, because it is fully subsidised were not supported by this research. What was apparent was the lack of awareness of and favour for this free service. Free services, in particular from mobile network operators, are viewed with scepticism, as the perception is that nothing is completely free.

In order to understand the ways in which people make use of the Internet (the third hypothesis), the study had to take into account a number of factors, which included the options to access the internet, motivations for Internet use, why they use the Internet the way they do, and how they use it. Context is a stronger determining factor contributing to what respondents use the Internet for than subsidised data. For example, respondents in rural South Africa favour operators that are dominant in the market because of extensive network coverage and the availability of signal; because family and friends are on the same network; and because of the promotions or rewards that come with using the network. The network that offers subsidised zero-rated content and a lower priced, service specific bundle is not used in the rural community, primarily because it is not available or the quality is poor. Most respondents access the Internet to facilitate efficient communication and find information. Only in Nigeria do respondents use the Internet when they have received rewards data (data received as a bonus or extra after purchasing a service) after recharging from their operator.

The diversity of content accessed varies. Google is the most popular means of searching for information, while social media sites are the most popular platforms for communication. Most respondents are unable to name their five top sites, but are able to use the Internet widely when they need to. In Nigeria and Rwanda local content sites are more popular than in other countries. Local content websites provide the relevant information and content needed. The factors for local content not being preferred as in other countries for example, requires further research to establish whether the issue is that there is no local content, or respondents are unaware of local content,

or the local content is seen as part of content more generally, because it is largely in English.

Mobile operators are no longer the only means of Internet access. There is an increased awareness of other data sources, such as free Wi-Fi. In Rwanda and South Africa, government-led public Wi-Fi initiatives are popular. However, these are mainly accessible in urban and peri-urban areas, with almost no presence in rural areas, where they are arguably most needed to stimulate use. Even within urban areas, locating public Wi-Fi spots is a challenge for respondents. In all the countries free commercial Wi-Fi, such as that in food outlets, is the most popular. Kenya and Rwanda provided interesting examples of Wi-Fi use on public transport, as the services had been launched through private and public initiatives. Internet cafés remain relevant to some users, especially those without mobile devices and countries with lower Internet penetration, such as Rwanda. These alternative platforms make it possible to use the Internet more extensively, with examples including downloading material, spending more time online and building job profiles.

Factors that limit Internet used are not simply related to affordability alone, but include issues of quality of service of mobile networks; lack of electricity; scepticism about relevance of content; privacy; and security issues for both users and non-users. Content scepticism highlights Beyond Access concerns that need to be addressed. In the scope of the study, it was mainly women who expressed worry about the content that they would be exposed to, once online. Only in Kenya and South Africa are there concerns of surveillance related to politics. These issues fall under the rights to privacy and freedom of expression discourse. However, fears of community surveillance need to be further understood in how they contribute to limitations to Internet use.

Gender, based on social context, does hinder the extent of Internet use (as opposed to Internet access). Women are concerned with how using the Internet could impact on their day-to-day lives. Women also reported lack of time, which needs to be addressed beyond the realm of digital policy.

RECOMMENDATIONS

Infrastructural issues still need to be addressed in rural areas, in particular to increase quality of service, which would allow users to choose any operator offering the cheapest product. There is also limited competition. Rural consumers option do not have same choice of operators as urban users. Historically in some countries operators have been required to roll out their services in a complementary manner so that national coverage could be achieved as quickly as possible. In many other countries (such as South Africa) this has happened on the basis of business choice. One operator has gone into a relatively uneconomic area to fulfil universal services obligations or because the area is adjacent to a more lucrative market that has already been serviced, and

for the first entrant a margin market might make sense but for a competitor might not. The effect of this, either way, is that in many rural areas there is only one operator and often rural communities are not able to enjoy the price benefits or choices offered in more competitive urban markets.

Several options exist that could immediately improve both the access and usage in rural communities by exploiting underutilised spectrum in rural areas. Secondary spectrum use, such as TV white space, through to dynamic allocation of unused spectrum in rural areas could provide access at a fraction of the cost of current GSM data services. Unused GSM spectrum assigned to operators at the national level, and which is unused in many rural areas could be reassigned for community self-provision. There are already successful and scalable projects of this kind in South Africa, such as Zenzeleni community network, where one of the rural focus groups was conducted[6].

The intensity of use could be enhanced through redirecting universal services funds directed at access, often by subsidising the already planned roll out of services , towards supporting the rollout of public Wi-Fi points at all public facilities such as schools, clinics, libraries and police stations. Successful deployment of Wi-Fi in South Africa and Rwanda's main cities shows widespread use by price sensitive users for data heavy activities and can include free e-government portals and services.

Internet use could be enhanced by providing free, low speed Internet (Freemium[7]) using widely available but increasingly redundant 2G spectrum or where 2G is being phased out (free 64Kb access to 3 and 4 G networks) to enable minimum and emergency communications by those unable to afford Internet access (Song, 2015).

Women, considered a marginalised group, are often targeted in digital policies. As women are concentrated amongst the poor, these pro-poor strategies also have the immediate potential of reducing digital gender inequalities. Other generalised interventions that improve privacy and anonymity and generally contribute to an environment of security and trust online would also enhance the experience of women on the Internet by improving their protection from unsolicited content or surveillance. This includes creating cybersecurity within a human rights framework which guarantees citizens' rights. The possibility of achieving this online in many countries where even offline rights do not exist is one of the biggest challenges.

Other factors limiting the digital participation of the poor and unskilled, particularly women, will require policy interventions than extend way beyond digital policy to the much greater challenges of human development. Without interventions to redress broader social and economic inequality in society more the entry of more sophisticated services and devices will amplify digital inequality.

[6] Zenzelani.net| Community networks zenzeleni.net

[7] Freemium is low bandwidth free service to basic and essential services, that users can upgrade to a paying service when they need high speed Internet.- https://manypossibilities.net/2015/11/zero-rating-a-modest-proposal/

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